

## **RAW SEQUENCE LISTING**

**The Biotechnology Systems Branch of the Scientific and Technical Information Center (STIC) no errors detected.**

Application Serial Number: 10/511,130  
Source: PCR/10  
Date Processed by STIC: 9/19/05

# ***ENTERED***



PCT

## RAW SEQUENCE LISTING

DATE: 09/19/2005

PATENT APPLICATION: US/10/511,130

TIME: 15:08:40

Input Set : A:\PTO.KD.txt

Output Set: N:\CRF4\09192005\J511130.raw

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3 <110> APPLICANT: The University of Newcastle
4     Connolly, Bernard
5     Fogg, Mark
6     Pearl, Laurence
8 <120> TITLE OF INVENTION: DNA POLYMERASES
10 <130> FILE REFERENCE: P89103PWO
C--> 12 <140> CURRENT APPLICATION NUMBER: US/10/511,130
C--> 13 <141> CURRENT FILING DATE: 2004-10-13
15 <160> NUMBER OF SEQ ID NOS: 32
17 <170> SOFTWARE: PatentIn version 3.1
19 <210> SEQ ID NO: 1
20 <211> LENGTH: 776
21 <212> TYPE: PRT
22 <213> ORGANISM: Unknown
24 <220> FEATURE:
25 <223> OTHER INFORMATION: Variant derived from Pyrococcus furiosus Pfu-Polymerase
27 <400> SEQUENCE: 1
29 Met Ala Ile Leu Asp Val Asp Tyr Ile Thr Glu Glu Gly Lys Pro Val
30 1           5           10           15
33 Ile Arg Leu Phe Lys Lys Glu Asn Gly Lys Phe Lys Ile Glu His Asp
34           20           25           30
37 Arg Thr Phe Arg Pro Tyr Ile Tyr Ala Leu Leu Arg Asp Asp Ser Lys
38           35           40           45
41 Ile Glu Glu Val Lys Lys Ile Thr Gly Glu Arg His Gly Lys Ile Val
42           50           55           60
45 Arg Ile Val Asp Val Glu Lys Val Glu Lys Lys Phe Leu Gly Lys Pro
46 65           70           75           80
49 Ile Thr Val Trp Lys Leu Tyr Leu Glu His Pro Gln Asp Val Pro Thr
50           85           90           95
53 Ile Arg Glu Lys Val Arg Glu His Pro Ala Val Val Asp Ile Phe Glu
54           100          105          110
57 Tyr Asp Ile Pro Phe Ala Lys Arg Tyr Leu Ile Asp Lys Gly Leu Ile
58           115          120          125
61 Pro Met Glu Gly Glu Glu Glu Leu Lys Ile Leu Ala Phe Asp Ile Glu
62           130          135          140
65 Thr Leu Tyr His Glu Gly Glu Glu Phe Gly Lys Gly Pro Ile Ile Met
66 145          150          155          160
69 Ile Ser Tyr Ala Asp Glu Asn Glu Ala Lys Val Ile Thr Trp Lys Asn
70           165          170          175
73 Ile Asp Leu Pro Tyr Val Glu Val Val Ser Ser Glu Arg Glu Met Ile
74           180          185          190
77 Lys Arg Phe Leu Arg Ile Ile Arg Glu Lys Asp Pro Asp Ile Ile Val
78           195          200          205

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81 Thr Tyr Asn Gly Asp Ser Phe Asp Phe Pro Tyr Leu Ala Lys Arg Ala
82      210                      215                      220
85 Glu Lys Leu Gly Ile Lys Leu Thr Ile Gly Arg Asp Gly Ser Glu Pro
86 225                      230                      235                      240
89 Lys Met Gln Arg Ile Gly Asp Met Thr Ala Val Glu Val Lys Gly Arg
90      245                      250                      255
93 Ile His Phe Asp Leu Tyr His Val Ile Thr Arg Thr Ile Asn Leu Pro
94      260                      265                      270
97 Thr Tyr Thr Leu Glu Ala Val Tyr Glu Ala Ile Phe Gly Lys Pro Lys
98      275                      280                      285
101 Glu Lys Val Tyr Ala Asp Glu Ile Ala Lys Ala Trp Glu Ser Gly Glu
102      290                      295                      300
105 Asn Leu Glu Arg Val Ala Lys Tyr Ser Met Glu Asp Ala Lys Ala Thr
106 305                      310                      315                      320
109 Tyr Glu Leu Gly Lys Glu Phe Leu Pro Met Glu Ile Gln Leu Ser Arg
110      325                      330                      335
113 Leu Val Gly Gln Pro Leu Trp Asp Val Ser Arg Ser Ser Thr Gly Asn
114      340                      345                      350
117 Leu Val Glu Trp Phe Leu Leu Arg Lys Ala Tyr Glu Arg Asn Glu Val
118      355                      360                      365
121 Ala Pro Asn Lys Pro Ser Glu Glu Glu Tyr Gln Arg Arg Leu Arg Glu
122      370                      375                      380
125 Ser Tyr Thr Gly Gly Phe Val Lys Glu Pro Glu Lys Gly Leu Trp Glu
126 385                      390                      395                      400
129 Asn Ile Val Tyr Leu Asp Phe Arg Ala Leu Tyr Pro Ser Ile Ile Ile
130      405                      410                      415
133 Thr His Asn Val Ser Pro Asp Thr Leu Asn Leu Glu Gly Cys Lys Asn
134      420                      425                      430
137 Tyr Asp Ile Ala Pro Gln Val Gly His Lys Phe Cys Lys Asp Ile Pro
138      435                      440                      445
141 Gly Phe Ile Pro Ser Leu Leu Gly His Leu Leu Glu Glu Arg Gln Lys
142      450                      455                      460
145 Ile Lys Thr Lys Met Lys Glu Thr Gln Asp Pro Ile Glu Lys Ile Leu
146 465                      470                      475                      480
149 Leu Asp Tyr Arg Gln Lys Ala Ile Lys Leu Leu Ala Asn Ser Phe Tyr
150      485                      490                      495
153 Gly Tyr Tyr Gly Tyr Ala Lys Ala Arg Trp Tyr Cys Lys Glu Cys Ala
154      500                      505                      510
157 Glu Ser Val Thr Ala Trp Gly Arg Lys Tyr Ile Glu Leu Val Trp Lys
158      515                      520                      525
161 Glu Leu Glu Glu Lys Phe Gly Phe Lys Val Leu Tyr Ile Asp Thr Asp
162      530                      535                      540
165 Gly Leu Tyr Ala Thr Ile Pro Gly Gly Glu Ser Glu Glu Ile Lys Lys
166 545                      550                      555                      560
169 Lys Ala Leu Glu Phe Val Lys Tyr Ile Asn Ser Lys Leu Pro Gly Leu
170      565                      570                      575
173 Leu Glu Leu Glu Tyr Glu Gly Phe Tyr Lys Arg Gly Phe Phe Val Thr
174      580                      585                      590
177 Lys Lys Arg Tyr Ala Val Ile Asp Glu Glu Gly Lys Val Ile Thr Arg

```

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178          595          600          605
181 Gly Leu Glu Ile Val Arg Arg Asp Trp Ser Glu Ile Ala Lys Glu Thr
182          610          615          620
185 Gln Ala Arg Val Leu Glu Thr Ile Leu Lys His Gly Asp Val Glu Glu
186 625          630          635          640
189 Ala Val Arg Ile Val Lys Glu Val Ile Gln Lys Leu Ala Asn Tyr Glu
190          645          650          655
193 Ile Pro Pro Glu Lys Leu Ala Ile Tyr Glu Gln Ile Thr Arg Pro Leu
194          660          665          670
197 His Glu Tyr Lys Ala Ile Gly Pro His Val Ala Val Ala Lys Lys Leu
198          675          680          685
201 Ala Ala Lys Gly Val Lys Ile Lys Pro Gly Met Val Ile Gly Tyr Ile
202          690          695          700
205 Val Leu Arg Gly Asp Gly Pro Ile Ser Asn Arg Ala Ile Leu Ala Glu
206 705          710          715          720
209 Glu Tyr Asp Pro Lys Lys His Lys Tyr Asp Ala Glu Tyr Tyr Ile Glu
210          725          730          735
213 Asn Gln Val Leu Pro Ala Val Leu Arg Ile Leu Glu Gly Phe Gly Tyr
214          740          745          750
217 Arg Lys Glu Asp Leu Arg Tyr Gln Lys Thr Arg Gln Val Gly Leu Thr
218          755          760          765
221 Ser Trp Leu Asn Ile Lys Lys Ser
222          770          775
225 <210> SEQ ID NO: 2
226 <211> LENGTH: 775
227 <212> TYPE: PRT
228 <213> ORGANISM: Pyrococcus furiosus
230 <400> SEQUENCE: 2
232 Met Ile Leu Asp Val Asp Tyr Ile Thr Glu Glu Gly Lys Pro Val Ile
233 1          5          10          15
236 Arg Leu Phe Lys Lys Glu Asn Gly Lys Phe Lys Ile Glu His Asp Arg
237          20          25          30
240 Thr Phe Arg Pro Tyr Ile Tyr Ala Leu Leu Arg Asp Asp Ser Lys Ile
241          35          40          45
244 Glu Glu Val Lys Lys Ile Thr Gly Glu Arg His Gly Lys Ile Val Arg
245          50          55          60
248 Ile Val Asp Val Glu Lys Val Glu Lys Lys Phe Leu Gly Lys Pro Ile
249 65          70          75          80
252 Thr Val Trp Lys Leu Tyr Leu Glu His Pro Gln Asp Val Pro Thr Ile
253          85          90          95
256 Arg Glu Lys Val Arg Glu His Pro Ala Val Val Asp Ile Phe Glu Tyr
257          100          105          110
260 Asp Ile Pro Phe Ala Lys Arg Tyr Leu Ile Asp Lys Gly Leu Ile Pro
261          115          120          125
264 Met Glu Gly Glu Glu Glu Leu Lys Ile Leu Ala Phe Asp Ile Glu Thr
265          130          135          140
268 Leu Tyr His Glu Gly Glu Glu Phe Gly Lys Gly Pro Ile Ile Met Ile
269 145          150          155          160
272 Ser Tyr Ala Asp Glu Asn Glu Ala Lys Val Ile Thr Trp Lys Asn Ile

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273				165				170				175
276	Asp	Leu	Pro	Tyr	Val	Glu	Val	Val	Ser	Ser	Glu	Arg
277				180				185				190
280	Arg	Phe	Leu	Arg	Ile	Ile	Arg	Glu	Lys	Asp	Pro	Asp
281			195					200				205
284	Tyr	Asn	Gly	Asp	Ser	Phe	Asp	Phe	Pro	Tyr	Leu	Ala
285		210					215					220
288	Lys	Leu	Gly	Ile	Lys	Leu	Thr	Ile	Gly	Arg	Asp	Gly
289	225					230					235	240
292	Met	Gln	Arg	Ile	Gly	Asp	Met	Thr	Ala	Val	Glu	Val
293				245						250		255
296	His	Phe	Asp	Leu	Tyr	His	Val	Ile	Thr	Arg	Thr	Ile
297				260						265		270
300	Tyr	Thr	Leu	Glu	Ala	Val	Tyr	Glu	Ala	Ile	Phe	Gly
301			275					280				285
304	Lys	Val	Tyr	Ala	Asp	Glu	Ile	Ala	Lys	Ala	Trp	Glu
305		290					295				300	
308	Leu	Glu	Arg	Val	Ala	Lys	Tyr	Ser	Met	Glu	Asp	Ala
309	305					310					315	320
312	Glu	Leu	Gly	Lys	Glu	Phe	Leu	Pro	Met	Glu	Ile	Gln
313				325						330		335
316	Val	Gly	Gln	Pro	Leu	Trp	Asp	Val	Ser	Arg	Ser	Ser
317				340						345		350
320	Val	Glu	Trp	Phe	Leu	Leu	Arg	Lys	Ala	Tyr	Glu	Arg
321			355					360				365
324	Pro	Asn	Lys	Pro	Ser	Glu	Glu	Glu	Tyr	Gln	Arg	Arg
325		370					375				380	
328	Tyr	Thr	Gly	Gly	Phe	Val	Lys	Glu	Pro	Glu	Lys	Gly
329	385					390					395	400
332	Ile	Val	Tyr	Leu	Asp	Phe	Arg	Ala	Leu	Tyr	Pro	Ser
333				405						410		415
336	His	Asn	Val	Ser	Pro	Asp	Thr	Leu	Asn	Leu	Glu	Gly
337			420							425		430
340	Asp	Ile	Ala	Pro	Gln	Val	Gly	His	Lys	Phe	Cys	Lys
341			435					440				445
344	Phe	Ile	Pro	Ser	Leu	Leu	Gly	His	Leu	Leu	Glu	Glu
345		450					455				460	
348	Lys	Thr	Lys	Met	Lys	Glu	Thr	Gln	Asp	Pro	Ile	Glu
349	465					470					475	480
352	Asp	Tyr	Arg	Gln	Lys	Ala	Ile	Lys	Leu	Leu	Ala	Asn
353				485						490		495
356	Tyr	Tyr	Gly	Tyr	Ala	Lys	Ala	Arg	Trp	Tyr	Cys	Lys
357				500						505		510
360	Ser	Val	Thr	Ala	Trp	Gly	Arg	Lys	Tyr	Ile	Glu	Leu
361			515								520	525
364	Leu	Glu	Glu	Lys	Phe	Gly	Phe	Lys	Val	Leu	Tyr	Ile
365		530					535				540	
368	Leu	Tyr	Ala	Thr	Ile	Pro	Gly	Gly	Glu	Ser	Glu	Glu
369	545					550					555	560

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DATE: 09/19/2005

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Input Set : A:\PTO.KD.txt

Output Set: N:\CRF4\09192005\J511130.raw

```

372 Ala Leu Glu Phe Val Lys Tyr Ile Asn Ser Lys Leu Pro Gly Leu Leu
373          565          570          575
376 Glu Leu Glu Tyr Glu Gly Phe Tyr Lys Arg Gly Phe Phe Val Thr Lys
377          580          585          590
380 Lys Arg Tyr Ala Val Ile Asp Glu Glu Gly Lys Val Ile Thr Arg Gly
381          595          600          605
384 Leu Glu Ile Val Arg Arg Asp Trp Ser Glu Ile Ala Lys Glu Thr Gln
385          610          615          620
388 Ala Arg Val Leu Glu Thr Ile Leu Lys His Gly Asp Val Glu Glu Ala
389 625          630          635          640
392 Val Arg Ile Val Lys Glu Val Ile Gln Lys Leu Ala Asn Tyr Glu Ile
393          645          650          655
396 Pro Pro Glu Lys Leu Ala Ile Tyr Glu Gln Ile Thr Arg Pro Leu His
397          660          665          670
400 Glu Tyr Lys Ala Ile Gly Pro His Val Ala Val Ala Lys Lys Leu Ala
401          675          680          685
404 Ala Lys Gly Val Lys Ile Lys Pro Gly Met Val Ile Gly Tyr Ile Val
405          690          695          700
408 Leu Arg Gly Asp Gly Pro Ile Ser Asn Arg Ala Ile Leu Ala Glu Glu
409 705          710          715          720
412 Tyr Asp Pro Lys Lys His Lys Tyr Asp Ala Glu Tyr Tyr Ile Glu Asn
413          725          730          735
416 Gln Val Leu Pro Ala Val Leu Arg Ile Leu Glu Gly Phe Gly Tyr Arg
417          740          745          750
420 Lys Glu Asp Leu Arg Tyr Gln Lys Thr Arg Gln Val Gly Leu Thr Ser
421          755          760          765
424 Trp Leu Asn Ile Lys Lys Ser
425          770          775
428 <210> SEQ ID NO: 3
429 <211> LENGTH: 776
430 <212> TYPE: PRT
431 <213> ORGANISM: Unknown
433 <220> FEATURE:
434 <223> OTHER INFORMATION: Variant derived from Pyrococcus furiosus Pfu-Polymerase
436 <400> SEQUENCE: 3
438 Met Ala Ile Leu Asp Val Asp Ala Ile Thr Glu Glu Gly Lys Pro Val
439 1          5          10          15
442 Ile Arg Leu Phe Lys Lys Glu Asn Gly Lys Phe Lys Ile Glu His Asp
443          20          25          30
446 Arg Thr Phe Arg Pro Tyr Ile Tyr Ala Leu Leu Arg Asp Asp Ser Lys
447          35          40          45
450 Ile Glu Glu Val Lys Lys Ile Thr Gly Glu Arg His Gly Lys Ile Val
451          50          55          60
454 Arg Ile Val Asp Val Glu Lys Val Glu Lys Lys Phe Leu Gly Lys Pro
455 65          70          75          80
458 Ile Thr Val Trp Lys Leu Tyr Leu Glu His Pro Gln Asp Val Pro Thr
459          85          90          95
462 Ile Arg Glu Lys Val Arg Glu His Pro Ala Val Val Asp Ile Phe Glu
463          100          105          110

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**VERIFICATION SUMMARY**

**PATENT APPLICATION: US/10/511,130**

**DATE: 09/19/2005**

**TIME: 15:08:41**

**Input Set : A:\PTO.KD.txt**

**Output Set: N:\CRF4\09192005\J511130.raw**

**L:12 M:270 C: Current Application Number differs, Replaced Current Application Number**

**L:13 M:271 C: Current Filing Date differs, Replaced Current Filing Date**